might get some light on the peculiar features of flotation and settling phenomena of plankton diatoms in sea water.

While my survey of the literature of sedimentation has not been comprehensive, it has been fairly representative, and I have been surprised that no mention has been made of the use of delta formation in the study of microscopic sediments. It has been many years since I first noticed the formation of deltas deposited in the process of filling Sedgwick-Rafter chambers, and it seems to me that any one caring to experiment a little could get excellent results by studying microscopic sediments through use of the delta principle.

I have been too closely occupied with my own routine to give much attention to the possibilities of the method, but I have tried it out a little with a sediment consisting mostly of particles which sank at high speed. With this material injected into a jar of water from a pipette bent to throw the particles directly horizontal at a height of about one inch from the bottom of the jar, I got a delta formation which seemed to have the particles sorted out to about the extent commonly seen in case of the larger particles composing an alluvial fan at the bottom of a moderate slope.

I believe that a little experience would enable one to regulate the height of the jet of sediment above the bottom, the distance from the sides of the vessel, the speed of flow from the jet and the volume of the jet so that the components of a mixed sediment would be fairly well separated in the delta. It appears also that the position of a particular type of particles in a delta formed under known conditions of distances, viscosity of fluid and speed and volume of the jet might provide an index to their rate of settling, as compared with other particles for which the rate may have been determined.

In addition it seems probable that by use of a beam of light thrown to particular or different points in front of the jet in a tall vessel the spread of particles from the jet and their processes of sinking might be followed and a more accurate understanding of their sinking behavior obtained than seems to be available at present. By using fluids of different viscosities for comparison, it might be possible, perhaps, to reach results of fairly high accuracy in this way.

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A NEW USE FOR CELLOPHANE

IT is sometimes convenient to make records of a permanent nature which can be reproduced on a screen by an arc lamp projection lantern. This can be accomplished in a very simple way at very low cost. Briefly, it is a method of typing on cellophane.

Cellophane is placed upon the carbon side of a sheet of carbon paper, which is placed in a typewriter with a backsheet to protect the rubber roll. Next the typewriter ribbon is adjusted the same as in the making of stencils. The letters which are produced in this way are dark and sharply defined. If a permanent record is to be made, the cellophane is placed between two pieces of glass cut to the size of projection lantern plates. If some discarded lantern plates are available, place them in water for a short time and then the emulsion can be scraped off. The pieces of glass are then sealed around the edges with mending tape. If the record is not of a permanent nature, the cellophane can be used between the plates without the necessity of the plates being sealed.

In making a graph the procedure is the same, with the exception that the graph is drawn on the cellophane with a pencil. The pencil will not mark, but a clear record is obtained from the carbon paper.

Care should be exercised in handling the cellophane, as the completed work can be rubbed off with the hands.

This method has proven satisfactory in the reproduction of the words of songs for chapel exercises and in the making of blueprints and in the drawing of graphs and diagrams to be used during an illustrated lecture when it is impossible to have the use of a blackboard or when a blackboard is not available. These are a few of the uses to which this work is adapted.

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A NEW MEDIUM FOR BAS-RELIEF MOLDS

DURING the past spring the science department of the Fountain Valley School of Colorado carried on a series of experiments at Chichen Itza, Yucatan, through the courtesy of Dr. Sylvanus G. Morley, of the Carnegie Institution. These were to determine a technique for rapidly making accurate and durable paper casts of the Mayan bas-reliefs in stone. The material selected for trial was a stereotype wet mat, known as "Nu Tex D," supplied through the courtesy of the Burgess Cellulose Company, of Freeport, Illinois.

After the usual run of failures and half-successes a successful technique was developed. The mats were soaked in water at 85° F—the temperature of the available supply—for several hours. They were then split so that the treated surface of the mat was backed by only three or four sheets of paper. The surfaced face was then placed against the stone to be cast, which had previously been thoroughly wet with water, and beaten in with a stereotyper's brush. In the case of vertical surfaces it was found necessary to rub some of the stripped backing into a maché and use daubs of it to hold the upper surface in place until the paper was beaten into the engraving. There was found to be sufficient give to the paper to beat into half-inch recesses without tearing. In cases where tearing occurred, as in deep relief or half-inch relief with close vertical sides, the tears were patched by applying small pieces of the stripped back sheets. When this first surface was complete, the deep recesses were filled with a pulp made by rubbing up the stripped back sheets. The excess moisture was then pressed out with the fingers and a sheet of backing patted on as an outer surface. A piece of wet bagging was then laid over the cast and the impression allowed to dry in place. At the time of year we were working, this took between three and six hours, depending upon the time of day and the depth of the relief. When dry the impressions were removed.

In the case of deep relief, it was found wise to finger the first surface to be sure it was in perfect contact with the stone at all points before filling in the recesses. The mats were successfully applied to reliefs ranging in depth from one fourth to a little over one inch. Absolutely no damage was observed to occur to the originals.

There are several distinct advantages for these casts. They are light, extremely durable, of excellent definition recording faithfully the finer detail, inexpensive, easy to manipulate and safe to use. Positives may be taken from them in plaster, glue and gelatine, or type metal.

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SPECIAL ARTICLES

THE OCCURRENCE OF THE PARALYTIC SHELL-FISH POISON IN THE COMMON SAND CRAB[1]

DURING studies of the past five years the paralytic poison which causes sporadic cases of illness and even death in humans after consumption of certain shellfish has been found in the Pacific Coast mussel, *Mytilus californianus,* and in most of the edible clams.[2] Of these, the varieties which are found along the open ocean shore (*Siliqua patula,* razor clam) and near the inlets of bays (*Saxidomus nuttallii,* Washington clam, and *Schizothaerus nuttallii,* horseneck clam), may be dangerously toxic, while *Paphia staminea* (quahog) usually contains less of the poison. *Mytilus edulis* (bay mussel) *Mya arenaria* (softshell clam) and *Ostrea lurida* (the native Pacific oyster), which grow at greater distances from the open ocean, have never yielded toxic extracts. It would be expected that animals which live in close contact with the harmful shellfish might be slightly poisonous, especially since recent experiments have shown that *Mytilus californianus* excretes the poison into the sea water under laboratory conditions. But in none other than bivalves had the toxic substance been demonstrated so far to any considerable amount.

During the recent outbreaks, however, of mussel and clam poisonings—June and July, 1932—tests on the small sand crab *Emerita analoga* (Stimpson) revealed the presence of the paralytic shellfish poison in high concentration in this crustacean. The table shows that animals of any size were poisonous. No difference was found in crabs remote from, or adjoining mussel beds. Analyses of separate parts of the body showed clearly that the poison is concentrated in the intestinal organs, probably the liver, as in the bivalves. The small amount found in other parts, especially in the gonads, must be attributed to dissemination of the poison during the dissection of the small animals. Due to their smaller size the males could not be tested separately as to toxicity of the gonads and the liver; the results in this instance refer to large female crabs. If the liver extracts of *Emerita analoga* from various places are compared with those of the livers of *Mytilus californianus* from near-by mussel beds the fact stands out clearly that both animals are roughly of the same toxicity at the same time. The poison from crabs gives symptoms identical with those from mussel poison when injected introperitoneally or fed to white mice.[3] The chemical properties likewise are in close agreement; the poison from both animals is readily soluble in water and alcohol, insoluble in ether and chloroform. Boiling with dilute alkali destroys its potency irreversibly, while it is stable in acid solution.

These findings are of significance in various respects. From the practical standpoint of public health it is important to have a readily available

[1] From the George Williams Hooper Foundation, University of California, San Francisco, California.

[2] See preliminary report by K. F. Meyer, *Am. Jour. Pub. Health,* Vol. 21, p. 767, 1931.

[3] M. Prinzmetal, H. Sommer and C. D. Leake, *Jour. Pharmacol.,* 1932, Vol. 46, p. 63.